British Journal of Psychology (2002), 93, 67–87

www.bps.org.uk

Conceptualization and measurement of celebrity worship

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Celebrity worship has been conceptualized as having pathological and nonpathological forms. To avoid problems associated with item-level factor analysis, 'top-down purification' was used to test the validity of this conceptualization. The respondents ($N = 249$) completed items modelled after existing celebrity worship questionnaires. A subset of 17 unidimensional and Rasch scalable items was discovered (the local reliability ranged from .71 to .96), which showed no biases related to age and gender. This subset was dubbed the Celebrity Worship Scale (CWS). The items also showed no celebrity bias, indicating that CWS applies equally to acting, music, sports, and 'other' celebrities. The Rasch nature of the items defines celebrity worship as consisting of three qualitatively different stages. Low worship involves individualistic behaviours such as watching and reading about a celebrity. At slightly higher levels, celebrity worship takes on a social character. Lastly, the highest levels are characterized by a mixture of empathy with the celebrity's successes and failures, over-identification with the celebrity, compulsive behaviours, as well as obsession with details of the celebrity's life. Based on these findings, the authors propose a model of celebrity worship based on psychological absorption (leading to delusions of actual relationships with celebrities) and addiction (fostering the need for progressively stronger involvement to feel connected with the celebrity).

A celebrity is 'known for being well-known' (Boorstin, 1961, p. 57), regardless of whether that eminence derives from the entertainment field, medicine, science, politics, religion, sports, or close association with other celebrities. Therefore, 'fame' is a psychological concept akin to object-relations theory (see also Elliot, 1998) and is multifaceted in scope. The psychological study of celebrity and fame has generally followed three trends. First, there is an interest in characteristics that distinguish

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eminent people with significant skills or intelligence from the general population (e.g. Albert, 1996; Simonton, 1999). Other studies have addressed how celebrity affects public attitudes such as consumer behaviour (Till & Shimp, 1998; Tripp, Jensen, & Carlson, 1994). Lastly, there are psychological consequences of achieving fame. For instance, Schaller (1997) found that in some instances fame leads to chronic self-consciousness and perhaps self-destructive behaviour. This is an important aspect to the study of fame and celebrity given that other research has linked depressive neurosis to over-identification with social roles and norms, feeling dependent on others, self-esteem problems, and unfulfilled wishes of love and acceptance (Frommer, Juetteman-Lembke, Stratkoetter, & Tress, 1995). Indeed, Giles (2000) has described several problems faced by celebrities, including loneliness, making new friendships that are genuine, and the loss of privacy.

However, as audiences and viewers increasingly come to 'know' persona by interpreting their appearance, gestures, conversation and conduct, celebrities are not the only ones affected by fame (Rubin & McHugh, 1987). The symbolic emotional and cognitive processes (Planalp & Fitness, 1999) that occur in normal human interaction also form the basis of the impersonal 'parasocial' relationships between fans and celebrities (Alperstein, 1991). In fact, mediated persona often become celebrities through this very process. Of course, parasocial interactions are part of normal identity-development. Yue and Cheung (2000) report that young people can have both idols and models. Idealism, romanticism, and absolutism seem more important in idol selection, whereas realism, rationalism, and relativism coincide with model selection. Children and adolescents often revere celebrities such as sport figures or pop singers (Greene & Adams-Price, 1990; Raviv, Bar-Tal, Raviv, & Ben-Horin, 1996), but this 'worshipping' of role models and celebrities usually decreases in intensity with age (Raviv *et al.*, 1996).

For some adults, however, celebrity worship apparently becomes a significant behavioural phenomenon that dominates their lives (for discussions, see e.g. Giles, 2000; Klapp, 1962). As this fact has received little empirical attention in the social sciences, we undertake here the construction of a questionnaire to study the emotional and cognitive dynamics of celebrity worshippers in more detail. Through the statistical methods described later, we also anticipate developing a more precise conceptualization of this phenomenon.

Rationale for a Celebrity Worship Scale

In recent decades American society has become increasingly more enthralled with the private lives of celebrities (Morton, 1997), and there is evidence that television has contributed to this trend (Bogart, 1980; Fishwick, 1969; Horton & Wohl, 1956; Powers, 1978). For example, a deliberate strategy of choosing newscasters for their physical attractiveness and encouraging them to adopt a warm, conversational approach has made celebrities out of people who do little more than read the news. Moreover, television news increasingly resembles celebrity gossip, as events that would not be considered newsworthy if they involved 'ordinary' people gain in importance when they happen to celebrities. Likewise, the illicit behaviour of some celebrities is forgiven and explained away when similar behaviour by non-celebrities would perhaps not be (Giles, 2000).

The social dramas surrounding celebrities' reported activities and life-events

profoundly affect some people, evoking responses ranging from the mildly unusual to the profoundly pathological. For instance, identification with celebrities can be a form of sexual and escape fantasy for those with unstable identities (Willis, 1972). More extreme yet, Marsden (1997) reported that devoted, but otherwise unrelated, fans of recently deceased celebrities sometimes experience bereavement hallucinations that are common reactions to grief and loss in surviving loved ones (Rosenblatt, Walsh, & Jackson, 1976). Indeed, one of the recurrent themes in both the popular and scholarly literature about fan motivation is 'psychopathology' (Caughey, 1978; Dowd, 1997; Schickel, 1985). In this context, we note that DSM-IV (American Psychiatric Association, 1994) includes the diagnostic category of 'Erotomania', namely, when an individual has delusions that another person of higher status (often a celebrity) is in love with him or her (e.g. Garland & McGennis, 1998; Vigano, 1996).

The above suggests that celebrity appreciation or worship falls into one or two broad groups with corresponding personality differences. First, mild (nonpathological) forms of celebrity worship, including 'fan clubs', appear to cater to introverts and intuitives (Stever, 1995), and celebrity worship is associated with a tendency for people to report fewer and less intimate friendships than they did before becoming a fan (Szymanski, 1977). By contrast, extreme (pathological) expressions of celebrity worship such as erotomania, stalking ('obsessional following'), and inappropriate correspondence with celebrities (Dietz, Matthews, Van Duyne, Martell, Parry, Stewart, Warrant, & Crowder, 1991; Leets, de Becker, & Giles, 1995) involve issues of trust and a faulty capacity to foster and maintain relationships (for an overview, see Meloy, 1998).

Although the 'psychopathology' that sometimes accompanies fan motivation is a recurrent theme in both the popular and scholarly literature (Caughey, 1978; Dowd, 1997; Schickel, 1985), the distinction between pathological and nonpathological celebrity worship is somewhat tenuous. As is discussed below, some researchers take celebrity worship to be a single variable, while others posit the existence of multiple worship factors.

Existing scales

A review of the literature uncovered only three scales related to the notion of celebrity worship. First, Rubin, Perse, and Powell (1985) developed the 20-item Parasocial Interaction Scale (PSI) to measure the extent to which television viewers develop parasocial relationships with newscasters. Factor analysis yielded a single factor that accounted for nearly half of the total variance. Sample items include: 'The newscasters make me feel comfortable, as if I were with friends', 'my favourite newscaster is like an old friend', and 'I find my favourite newscaster ... attractive'. Parasocial interaction correlated with affinity for news ($r = .61$) and the perception that the news reflects reality ($r = .47$). The PSI was later modified to address 'your favourite television performer' (Rubin & McHugh, 1987). Respondents with high PSI scores tended to find their favourite performer socially attractive ($r = .35$), and they placed a high value on the 'relationship' with their favourite performer ($r = .52$). We note that these patterns strongly resemble those found for adolescent idolization of celebrities (Greene & Adams-Price, 1990).

Other authors found evidence for a multi-factor perspective. In particular, Stever's (1991) Celebrity Appeal Questionnaire (CAQ) aimed to 'operationalize constructs related to parasocial attraction' (p. 859). Its 26 items were reduced to four factors:

sex appeal, hero/role model, entertainer, and mystique. Using pop singer Michael Jackson as a target, the first three factors successfully predicted scores on a 'how dedicated a fan are you?' rating scale. Finally, Wann (1995) developed a 23-item Sport Fan Motivation Scale (SFMS). Factor analysis yielded eight reasons for sport fandom: self-esteem, escape, entertainment, family, group affiliation, aesthetic, eustress or excitement, and economic. Total SFMS scores correlated .70 with self-reports of sports fandom, as well as with the degree to which friends were sports fans ($r = .55$).

The questionnaires mentioned above all have adequate reliability from a classical test theory point of view. Also, there is evidence of construct validity as at least some questions clearly address celebrity worship. At the same time, however, a number of shortcomings can be noted. For instance, it has long been known that factor analysis of individual items provides an inadequate test of their dimensionality (Comrey, 1978; cf. Panter, Swygert, Dahlstrom, & Tanaka, 1997), and computer simulations (Lange, Irwin, & Houran, 2000) indicate that 'phantom factors' may be found due to response biases. Moreover, the authors erroneously (cf. Michell, 1990) seem to assume that the finding of an interpretable factor structure automatically guarantees that the constituent items, or the associated factor scores, form well-defined scales of measurement. Additionally, the earlier questionnaires have a limited scope as they address particular kinds of celebrities (i.e. newscasters, rock stars, athletes) at the expense of others. For instance, the economic factor in Wann's (1995) SFMS (betting on the outcome of sporting events) seems irrelevant when applied to celebrities outside the realm of competitive sport. Likewise, while the SFMS' 'sex appeal' factor may be relevant when rating a rock star, it is less likely to apply to celebrities in the realms of religion and literature.

The following section outlines how these shortcomings can be addressed within a top-down purification framework that combines Rasch (1960) scaling with tests for unidimensionality and response biases (Lange *et al.*, 2000a; Lange, Thalbourne, Houran, & Storm, 2000b). As this approach may not be familiar to all readers, we discuss the features that pertain directly to the present research in some detail.

Rasch scaling

To obtain a rigorously defined worship measure, we use a Rasch scaling approach which models respondents' answers as a function of the latent variable addressed by the items (for recent overviews, see e.g. Embretson & Hershberger, 1999; van der Linden & Hambleton, 1997; Wright, 1999). In the present context, this latent variable is assumed to reflect celebrity worship, and this variable will be assessed via rating scales (cf. Wright & Masters, 1982). In this case, Rasch scaling relates the probabilities that person n when faced with item i will give either give rating j (denoted by $P_{n_i j}$) or $j-1$ (denoted by $P_{ni(j-1)}$), as is described by equation (1) (see e.g. Linacre, 1994):

$$\log\left(\frac{P_{n_i j}}{P_{ni(j-1)}}\right) = \theta_n - \Delta_i + \delta_{ij}. \tag{1}$$

In this equation, the log ratio of these respective probabilities is modelled as an additive function of θ_n (the person's level of celebrity worship), Δ_i (the worship level implied by the item), while the item-specific 'step-parameter' δ_{ij} quantifies the *increase* in celebrity worship needed to select category j rather than category $j-1$ relative to the item location Δ_i. In other words, for item i the transition from a lower category $j-1$ to a higher category j occurs at the step location $\Delta_i + \delta_{ij}$.

Given the log ratio in the left-hand side of equation (1), the quantities θ, Δ, and δ are

said to be expressed in 'logits' (for a discussion, see e.g. Ludlow & Haley, 1995; Wright & Stone, 1979). Naturally, the logit values of the various parameters are not known beforehand and these must be estimated using Rasch scaling software (Linacre, 1994; Linacre & Wright, 1998; Wu, Adams, & Wilson, 1998). Doing so also provides important information concerning the fit of the items and the rating scale categories. In particular, the *outfit* quantifies the extent to which an item fits the model relative to items with dissimilar locations, whereas the *infit* quantifies items' fit relative to those with similar locations (cf. Wright & Stone, 1979). The theoretical value of both statistics is 1. Items with fit values greater than 1 provide 'noisy' information, while those with values less than 1 may be redundant. Due to sample fluctuations, the theoretical value is rarely achieved and *infit* and *outfit* values in the range 0.7 to 1.3 are generally deemed acceptable. However, a slightly greater range of fit values has been used as well (Linacre, Heinemann, Wright, & Granger, 1994).

The fit of the rating scales is expressed by the *outfit* of the their step values, and similar criteria apply. Additionally, it is often instructive to plot the category probabilities P_{*ij} which represent the likelihood of selecting a particular category given the distance between θ and Δ_i.

Reliability

Rasch scaling expresses the reliability of the person measures θ in terms of their standard error of estimate (SE_θ) as computed by the scaling software (Facets), and, in the absence of bias (see below), these standard errors are sample independent. The SE_θ are 'local' as they vary with the person measures, and they typically reach a maximum for the most extreme (low and high) person measures. In terms of classical test theory, this means that the reliability of the measures varies with extremity as well. To study such variations, researchers (Daniel, 1999; Lange *et al.*, 2000b) define the pseudo-Rasch reliability coefficients as:

$$R_\theta = 1 - \frac{SE_\theta^2}{S_\theta^2} \tag{2}$$

where S_θ denotes the standard deviation of the person measures (θ). Note that equation (2) is obtained by substituting the Rasch SE_θ into classical test theory's definition of reliability (cf. Lord & Novick, 1968). For simplicity, the subscript θ is omitted in the following.

Dimensionality

The finding of acceptable item *infit* and *outfit* values provides evidence that the Rasch variable is unidimensional (Hattie, 1985), but this criterion may fail in the presence of nearly orthogonal factors (Smith, Shumaker, & Bush, 1998). Fortunately, additional information can be obtained via Winsteps' (Linacre & Wright, 1998) principal component analysis of the items' residuals (i.e. the item correlations that remain after removing the Rasch dimension). When multidimensionality exists, the recently developed ConQuest software (Wu *et al.*, 1998) can be used to extend Rasch scaling to multidimensional models. In addition to estimates of the direct (i.e. unattenuated) correlation between the factors, ConQuest also provides χ^2 indices of fit. Thus, competitive tests can be performed between nested models of different dimensionality. Each of the above approaches will be exploited to determine the dimensionality of celebrity worship.

Item bias

Note that the quantity Δ in equation (1) is not subscripted by the person index n, i.e. this parameter is assumed to be invariant across respondents. Violations of this invariance imply that different respondents interpret the same question in different ways (Lange, Irwin, & Houran, 2001), and this may introduce biases into the person measure θ. Accordingly (cf. Lange *et al.*, 2000a, 2000b); we exclude any items that are biased with respect to respondents' age or gender. As stated earlier, one of the main purposes of the present research is to create a scale that applies equally to different celebrity types. For this reason, we will also exclude items that show celebrity bias.

Finally, in the present context the notion of pathology is inextricably linked to that of the extremity of the celebrity worship. This implies that care must be taken that the questions are interpreted in the same fashion regardless of respondents' worship levels. Note that this does *not* mean that low and high worshippers should give the same ratings. However, all respondents should agree on the extent to which each item is indicative of celebrity worship. This assumption can be tested by comparing the item locations as computed for respondents high in celebrity worship versus those for respondents with low levels of celebrity worship.

Method

Sample

Participants were 249 individuals (157 women and 92 men). They were recruited by 12 confederates who had been instructed to identify respondents of various educational backgrounds. The ages of the respondents ranged from 10 to 68 years ($M = 32.7$, SD = 12.6, median = 32). About 12% of were college graduates, while 30% had completed at least one year of college. Respondents' choices of favourite celebrities are discussed in a later section.

Materials

Items

We used Wann's (1995) SFMS as a starting-point in writing the items for our Celebrity Worship Scale (CWS). Specifically, six items addressed entertainment issues ('I enjoy my favourite celebrity because of her/his entertainment value'), and another six addressed social or group affiliation motives ('My friends and I like to discuss what my favourite celebrity has done'). Five items were designed to measure self-esteem ('The successes of my favourite celebrity are my successes also'), while six items were intended to measure escape ('News about my favourite celebrity is a pleasant break from a harsh world'). Finally, five items addressed what could be called pathological overidentification ('When my favourite celebrity dies I will feel like dying too'). No items related to economic, eustress, and aesthetic issues were included, as these seemed too specific to sports. Also, the family factor was discarded partly because those watching sports so as to spend more time with their family are not always sports fans (Wann, Schrader, & Wilson, 1999).

This produced a set of 33 items that were to be rated on a 5-point Likert type rating scale with 5 being 'strongly agree', 1 being 'strongly disagree', and 3 being 'uncertain or neutral'. All but six of the items were worded such that agreement indicated a positive attitude toward the favoured celebrity.

Celebrity interest

We also determined how celebrity worship is related to some widely known recent events. In

Table 1. Basic scaling properties of the 17 CWS items

Items Fantasy: Items recoded as 0, 1, 1, 2, 3[a]	Δ[e]	SE	Infit[b]	Outfit[b]
5 My friends and I like to discuss what my favourite celebrity has done	−0.26	0.11	1.0	1.1
13 I enjoy watching, reading, or listening to my favourite celebrity because it means a good time	−2.00	0.10	**1.4**[c]	**1.4**
17 I love to talk with others who admire my favourite celebrity	−0.95	0.10	1.0	1.0
19 Learning the life story of my favourite celebrity is a lot of fun	−1.36	0.10	1.2	1.3
23 It is enjoyable just to be with others who like my favourite celebrity	−0.60	0.11	1.0	0.9
29 I like watching and hearing about my favourite celebrity when I am in a large group of people	−0.77	0.11	1.1	1.1
31 Keeping up with news about my favourite celebrity is an entertaining pastime	−1.03	0.10	1.2	1.2
Category outfit—Minimum				1.0
Category outfit—Maximum				1.3
Possible pathology: Items recoded as 0, 1, 1, 2, 2[d]	Δ	SE	Infit	Outfit
3 I am obsessed by details of my favourite celebrity's life	1.73	0.13	1.1	1.2
6 When something good happens to my favourite celebrity I feel like it happened to me	1.23	0.12	0.8	0.7
9 I have pictures and/or souvenirs of my favourite celebrity which I always keep in exactly the same place	0.31	0.13	1.2	1.2
12 The successes of my favourite celebrity are my successes also	0.58	0.13	0.9	0.9
14 For me, 'following' my favourite celebrity is like daydreaming because it takes me away from life's hassles	−0.20	0.12	0.9	1.1
15 I have frequent thoughts about my favourite celebrity, even when I don't want to	0.80	0.14	0.9	0.8
16 When my favourite celebrity dies (or died) I will feel (or felt) like dying too	0.96	0.14	1.0	1.1
18 When something bad happens to my favourite celebrity I feel like it happened to me	0.65	0.14	0.8	**0.6**
21 I often feel compelled to learn the personal habits of my favourite celebrity	−0.25	0.12	0.9	0.8
24 When my favourite celebrity fails or loses at something I feel like a failure myself	1.17	0.15	0.9	**0.6**
Category outfit—Minimum				0.9
Category outfit—Maximum				1.2

[a]The respective step values are −2.38, 0.25, and 2.13.
[b]Facets reports only one decimal value for these statistics.
[c]Infit and outfit indices outside the range 0.7 to 1.3 are shown in boldface.
[d]The respective step values are −1.30 and 1.30.
[e]The item locations are expressed in logits.

particular, respondents were asked to rate the news coverage of the O. J. Simpson trial, the death of Princess Diana, and the plane crash of John F. Kennedy. A 7-point Likert scale ranging from 'Far too little' to 'Far too much' was used whose middle category was labelled 'About right'. Finally, they rated themselves on the question 'In relation to other people that you know, how would you rate your interest in celebrities generally?' using a 7-point scale ranging from 1 'very weak interest' to 7 'very strong interest'.

Software

The bulk of the Rasch scaling analyses were performed using Facets (Linacre, 1994).[1] This software also provided bias tests for the individual items (an appropriate z statistic), as well as an omnibus χ^2 test for each independent variable across all items. Additionally, Winsteps (Linacre & Wright, 1998) and ConQuest (Wu *et al.*, 1998) were used to study the dimensionality of the items.

Preliminary analyses

When all available items were scaled simultaneously severe misfit resulted, indicating that at least some items had to be eliminated. Using a top-down purification approach (Lange *et al.*, 2000a, 2000b); scaling runs were alternated with tests for bias due to gender (men versus women), age (above versus below median), and favourite celebrity type (acting versus non-acting). Also, as in previous research (Lopez, 1996; Thomeé, Grimby, Wright, & Linacre, 1995; Zhu, Updyke, & Lewandowski, 1997), the fit of the rating scales was improved by selectively combining adjacent categories. Throughout, biased items with the poorest fit were eliminated first. This yielded the 17 items shown in Table 1, most of which have *infit* and *outfit* statistics (columns 3 and 4) within the range of 0.7 to 1.3. Only three transgressions occur, as marked in boldface. That is, the fit statistics of Item 13 (i.e. 1.4) exceed 1.3, indicating that this item provides somewhat noisy information. The item was kept, however, to increase the range of the scale. Also, Items 18 and 24 are perhaps slightly redundant, as their *outfit* falls below 0.7.

To achieve an optimal category fit, two different rating scale structures were required. In particular, the 1 to 5 ratings of the seven items listed in the top part of Table 1 were recoded as 0, 1, 1, 2, and 3, respectively, while the ratings of the remaining items (bottom part) were recoded as 0, 1, 1, 2, and 2.[2] The results of additional Facets runs (not shown) indicated that the locations of the 17 items are approximately equal for younger versus older respondents, men versus women, and acting versus non-acting worshippers (all $p > .01$). Also, Facets' omnibus test across the four major celebrity types (acting, music, sports, and 'other') showed an absence of bias ($\chi^2_{68} = 72.2$, $p > .20$). The absence of celebrity biases is especially important because it implies that the items in Table 1 define a *common scale across the different types of celebrity worshippers*.

Collectively, the 17 items in Table 1 define our Celebrity Worship Scale. To achieve a convenient scale metric, the logit values were transformed linearly so as to produce a person measure with a mean of 50 and a standard deviation of 10. This transformed metric is used throughout the following.

Results

Celebrity worship

Figure 1 shows a 'map' which orders the CWS items according to their transformed Rasch locations. It can be seen that their ordering reflects three basic types (or perhaps

[1] A publicly accessible repository of information related to Rasch scaling can be found at the website www.rasch.org. Visitors may also download at no charge functional copies of the Facets and Bigsteps Rasch scaling software.
[2] In other words, ours is a hybrid approach in that it uses more than a single category structure (Andrich, 1978), but not a different one for every rating scale as in Wright and Masters' (1982) partial credit model.

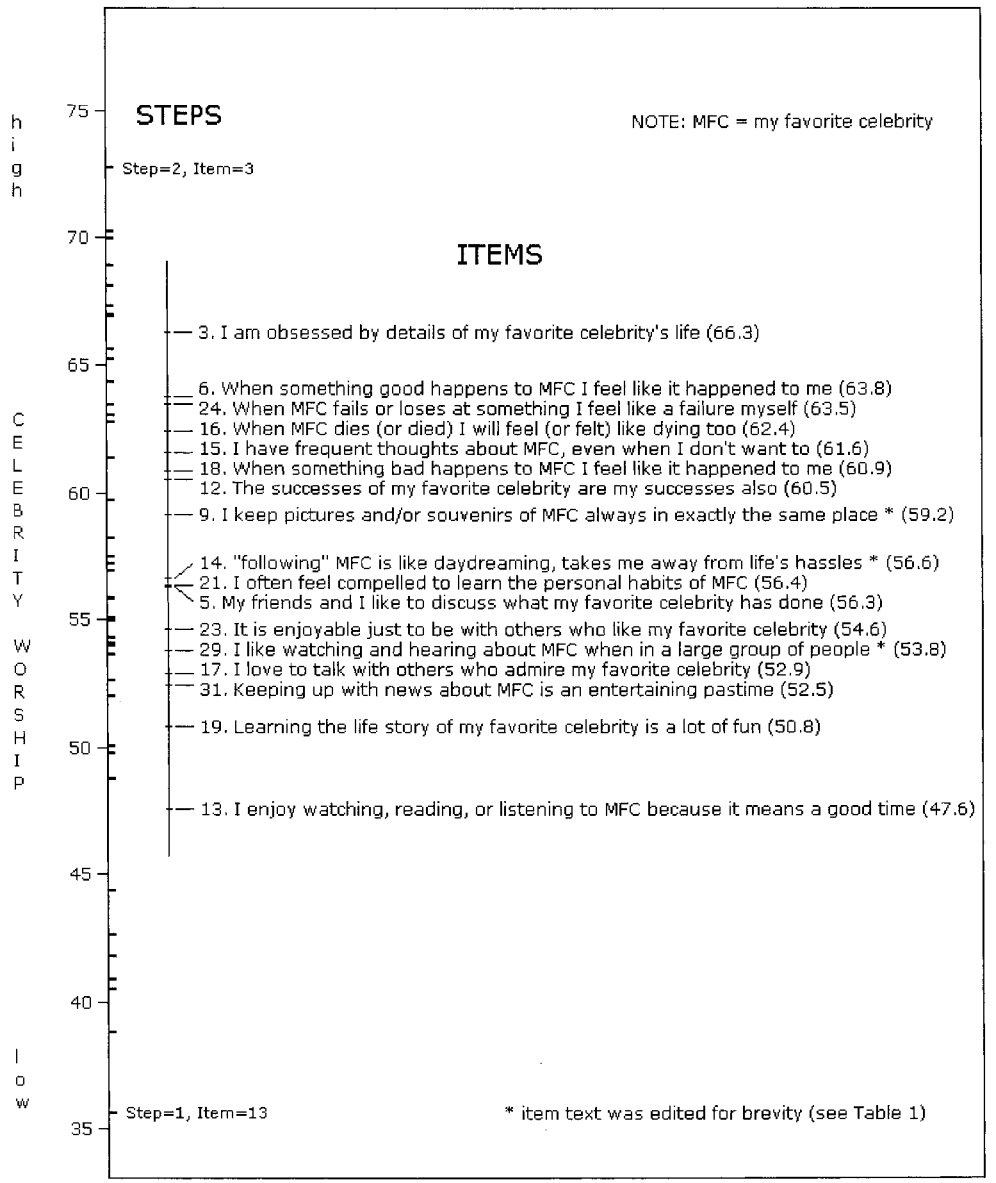

Figure 1. A map of the celebrity worship items.

stages) of celebrity worship. First, low worship levels involve individualistic behaviours such as watching, reading and learning about, keeping up with, or listening to celebrities (Items 13 and 19) for purposes of entertainment (Item 31). Secondly, slightly higher levels of celebrity worship are characterized by social activities such as watching, hearing, and talking about the celebrity in the company of other fans (Items 17, 29, and 23) or friends (Item 5). Thirdly, the highest worship levels present a rather mixed picture. On the one hand, the items suggest empathy, as highly worshipping individuals identify with their favourite celebrity's successes and failures (Items 12, 24, and 6). However, such empathy is accompanied by over-identification (Item 16), compulsive

behaviours related to the keeping of pictures and souvenirs (Item 9), repetitive thought patterns (Item 18), and an obsession with 'details of my favourite celebrity's life' (Item 3).

In interpreting Fig. 1, it should be kept in mind that Rasch scaling produces a probabilistic item hierarchy. Thus, the behaviours described by the 'high' items do not replace the behaviours described by the 'low' items. Rather, as celebrity worship increases, these behaviours increasingly occur together. For instance, respondents who admit feeling like a failure when their favourite celebrity fails (Item 24), most likely also enjoy watching or reading about this celebrity (Item 19) or learning about this celebrity (Item 13). We point out that only item location differences that exceed 1.7 scale units should be interpreted as meaningful ($p > .05$).[3] Thus, it is interesting to note that the location of Item 6 ($\Delta = 63.8$, 'When something good happens...') significantly exceeds that of Item 18 ($\Delta = 60.9$, 'When something bad happens to my favourite celebrity...'). In other words, higher levels of worship are required to identify with celebrities' successes than with their failures. Finally, none of the negatively worded items (e.g. 'I do *not* feel driven to be involved in the personal life of my favourite celebrity') survived, indicating that negatively worded items are not simply the opposite of similar positively worded items (e.g. Item 3). This pattern of findings agrees with those obtained by Yamaguchi (1997).

Although respondents clearly differ with respect to the extent to which they endorse the CWS items ($\chi^2_{237} = 2262.1$, $p < .001$), the item hierarchy should not vary with their worship levels. To verify this assumption, high and low-scoring respondent groups were created based on the median worship and the locations of all 17 items were recomputed for these two groups. Facets' omnibus bias test detected no significant overall differences in the items' locations ($\chi^2_{34} = 38.0$, $p > .20$) in the two groups, and only one of the 17 comparisons was significant at $p < .01$. As this outcome is likely the result of chance alone ($p > .15$), we conclude that the item hierarchy in Fig. 1 is indeed invariant across respondents' levels of celebrity worship.

Person measures

The CWS yields measures that are approximately normally distributed ($\chi^2_{236} = 225.7$, $p > .20$), provided that the most extreme respondents are ignored (see Fig. 2). Table 2 shows how its measures (column 1) and their local standard errors of measurement (SE, column 2) are derived from respondents' summed ratings. Note that the scale extends further upward than downward and that the SE tend to be smaller above the mean than below the mean. Thus, high-worshipping respondents are measured more reliably than low-worshipping respondents. As is reflected by the tick marks on the inside Y-axis in Fig. 1, this asymmetry is due to the fact that the step values of most rating scales (i.e. $\Delta_i + \delta_{ij}$) lie above the respondents' average of 50.

Naturally, the relatively small SE translate into high local reliabilities as computed via equation (2). Specifically, the curve in Fig. 2 indicates that a maximum of .96 is reached between 53 and 63, and that the local reliability always exceeds .71 except for the most extreme measures. For comparison, Fig. 2 also plots the magnitude (.93) of the traditional coefficient α. As is typical, this coefficient underestimates the reliability

[3] The standard error of the location difference $S_{\Delta_i - \Delta_j}$ is $\sqrt{SE^2_{\Delta_i} + SE^2_{\Delta_j}}$, where the SE_Δ are provided by Facets. Assuming equal SE, this simplifies to $S_{\Delta_i - \Delta_j} = 1.41SE$. As the standard error of estimate of the item locations is about 0.60 transformed units, a pair-wise difference of about 1.7 units is required to achieve statistical significance at $p < .05$ assuming an approximately normal sampling distribution of the Δ.

Table 2. Rating sum to Rasch measure conversion ($M = 50$, $SD = 10$)

Sum[a]	Measure[b]	SE	Sum[a]	Measure[b]	SE
0	23.8	9.4	21	57.4	2.0
1	30.3	5.4	22	58.1	2.0
2	34.5	4.0	23	58.9	2.0
3	37.2	3.5	24	59.7	2.0
4	39.4	3.1	25	60.5	2.0
5	41.2	2.9	26	61.2	2.0
6	42.8	2.7	27	62.0	2.0
7	44.2	2.6	28	62.8	2.0
8	45.5	2.5	29	63.7	2.1
9	46.7	2.4	30	64.5	2.1
10	47.8	2.3	31	65.4	2.1
11	48.9	2.3	32	66.4	2.2
12	49.8	2.2	33	67.3	2.3
13	50.8	2.2	34	68.4	2.3
14	51.7	2.1	35	69.5	2.5
15	52.6	2.1	36	70.8	2.6
16	53.4	2.0	37	72.3	2.8
17	54.2	2.0	38	74.1	3.2
18	55.0	2.0	39	76.5	3.8
19	55.8	2.0	40	80.3	5.2
20	56.0	2.0	41	86.6	9.3

[a]Before adding, the 1 through 5 ratings for Items 5, 13, 17, 19, 23, 29, and 31 should be recoded as 0, 1, 1, 2, and 3, respectively. The ratings of Items 3, 6, 9, 12, 14, 15, 16, 18, 21, and 24 should be recoded as 0, 1, 1, 2, and 2.

[b] The transformed measures can be rounded to the nearest integer without noticeable loss of precision.

near the middle of the scale, while overestimating the reliability of more extreme measures.

Age, gender, and favourite celebrity

To determine whether respondents' age and gender predict their favourite celebrity, we performed a log-linear analysis of the contingency table defined by these three variables. Backward elimination indicated that acceptable model fit ($\chi^2_4 = 3.46$, $p > .50$) was obtained by retaining just the relations between age (below versus above median) and celebrity type ($\chi^2_3 = 30.92$, $p < .001$) and that between gender and celebrity type ($\chi^2_3 = 16.53$, $p < .001$). As is shown on the left side of Table 3, men as well as women most often mentioned acting celebrities as their favourites. However, men selected music celebrities far less often and focused on sports celebrities instead (cf. Levin & Arluke, 1985). The right side of the table indicates that older respondents favour 'other' celebrities over those in the areas of acting, music, and sports, while younger respondents most often favour actors. Also, the selection of sports celebrities decreases with age.

Next, the intensity of respondents' celebrity worship was analysed using a 2 (Age: Younger versus Older) × 2 (Gender) × 4 (Favourite Celebrity: Acting, Music, Sports, and 'Other') analysis of variance over the CWS measures. A main effect of gender was found

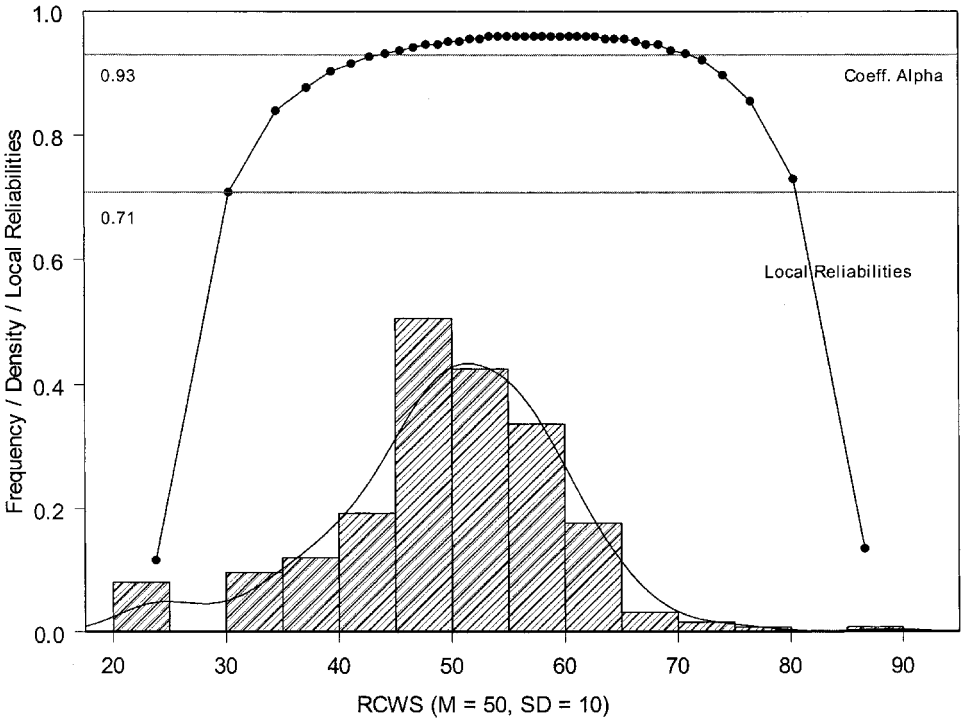

Figure 2. Sample frequencies, density line and local reliabilities of the CWS.

($F(1,233) = 4.55$, $p < .05$) as, on average, men ($M = 51.5$) scored about 0.25 SD higher than women ($M = 49.0$). Additionally, the four celebrity types were worshipped with different intensities ($F(3,233) = 3.25$, $p < .05$), and *post hoc* tests ($p < .05$) using Tukey's HSD approach revealed that music ($M = 54.6$) and sports ($M = 53.4$) celebrities were worshipped more intensely than acting ($M = 49.0$) and 'other' ($M = 47.2$) celebrities. Since the differences between these four means are considerable (they span over 0.7 SD), we investigated the possibility that the celebrity effect is due to outliers. However, only three outlying cases could be identified and we further note that the variances in the four worship groups were not significantly different

Table 3. Frequency of favourite celebrity by gender and age

	Gender		Age		
Favourite celebrity	Women	Men	Younger	Older	Total
Acting	63	35	54	43	97
Music	40	10	29	21	50
Sports	9	18	20	7	27
Other	46	29	17	58	75
Total	157	92	120	129	249

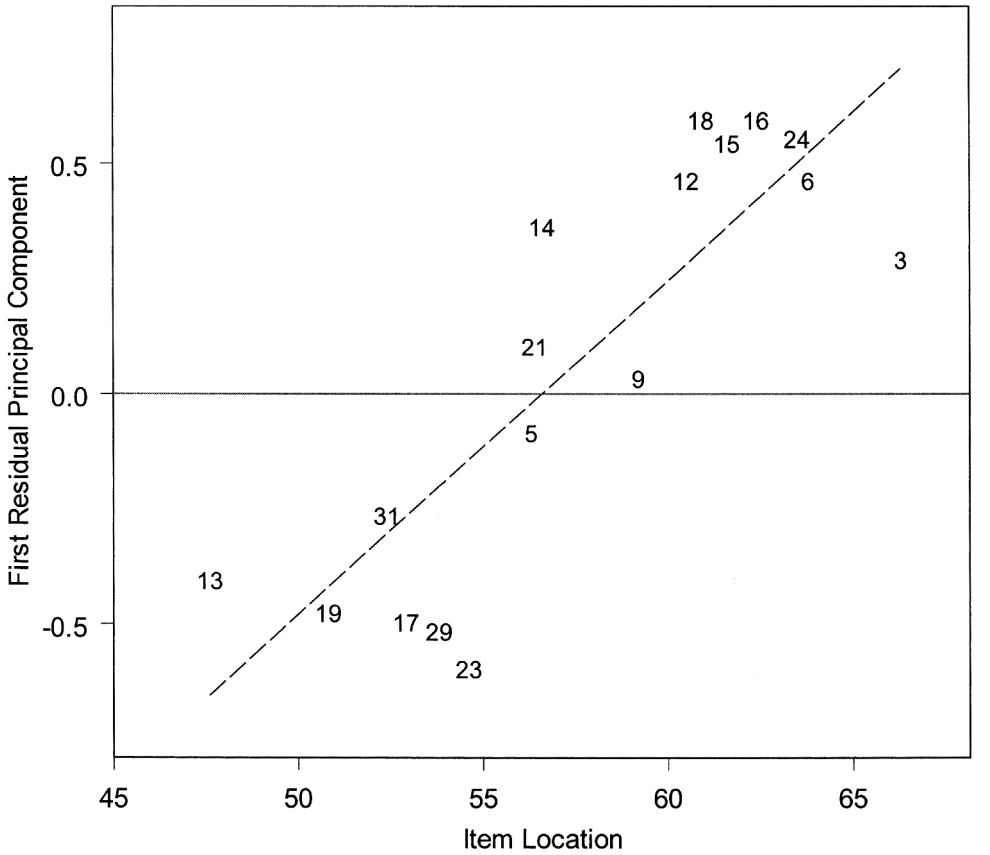

Figure 3. Loadings on first residual principal component by item location.

($F(15,233) = 1.34$, $p > .15$). None of the other effects in the analysis reached statistical significance (all $p > .10$).

Celebrity interests

There is some evidence for the convergent validity of the CWS as its rank correlation with respondents' ratings of their own interest in celebrities in general is highly significant ($\rho = .49$, $p < .001$). However, relatively few respondents identified O. J. Simpson ($N = 0$), Princess Diana ($N = 5$), or John F. Kennedy ($N = 2$) as their favourite celebrity. It is not surprising therefore that the summed ratings regarding the adequacy of the news coverage of these celebrities (see Method section) correlated only moderately (but as expected) with the CWS ($\rho = -.35$, $p < .001$).

Is there a separate pathology dimension?

The fit statistics shown in Table 1 support the assumption that the CWS items are sufficiently unidimensional to be Rasch scalable (cf. Hattie, 1985; Smith *et al.*, 1998). However, the map in Fig. 1 suggests that the items vary not only in worship itensity, but also with respect to pathology. To determine the presence of additional factors, the

items' Rasch residuals were analysed via the principal component approach provided by the Winsteps software (Linacre & Wright, 1998). Figure 3 shows that a secondary factor was found which explains about 19% of the residual variance. The items' loadings on this residual factor vary with their Rasch locations (Δ) such that the items receiving the highest ratings (low Δ) load negatively, while those receiving the lowest ratings (high Δ) load positively.

It is tempting to interpret items with positive loadings on the residual factor as indicative of pathological worship, and those with negative loadings as reflecting simple fantasy worship.[4] At first sight, this interpretation is supported by competitive model test via the ConQuest software (Wu *et al.*, 1998). That is, when the items with negative loadings and those with positive loadings are treated as a two-factor Rasch model, a better fit is obtained than when all 17 items are taken to be a single factor ($\chi^2_2 = 158.24$, $p < .001$). Yet, despite the superior fit of the two-factor model, the direct correlation between the two factors is very high ($r = .85$) thus making any distinction meaningless in practice. Also, attempts to derive additional Rasch factors from the remaining 16 items (i.e. those *not* listed in Table 1) consistently met with failure. We noted earlier that the item hierarchy did not vary with respondents' age, gender, favourite celebrity, and their levels of celebrity worship. Therefore, the residual factor also cannot be construed as an artifact due to biases in respondents' interpretations of the CWS questions.

In summary, there are no compelling reasons to presume the existence of a distinct pathological worship factor. Rather, the item hierarchy in Fig. 1 suggests that sufficiently high levels of celebrity worship invariably lead to signs of pathology.

Summary and discussion

Starting with a pool of 33 items inspired by previous research, Rasch scaling yielded a 17-item Celebrity Worship Scale (CWS) with excellent psychometric properties and acceptable reliability (the local reliabilities ranged from .71 to .96). Also, preliminary tests suggest some construct validity. As suits the purpose of the scale, the reliability of the CWS is greater at higher worship levels than at lower levels. We stress that its items contain no noticeable biases related to respondents' age, gender, favourite celebrity type, as well as their levels of worship. The absence of celebrity bias is especially important as it implies that the CWS may be used to compare the intensity of respondents' worship levels across different types of celebrities. Doing so indicated that music and sports celebrities were worshipped more intensely than acting and 'other' celebrities. It may seem surprising that the men in our sample scored significantly higher on the CWS than the women, but this is consistent with Levin and Arluke's (1985) finding that men gossip more than women about media celebrities. While these demographic findings cannot be attributed to response biases, they should be interpreted with some caution since our respondents were not randomly selected from the population.

Contrary to our expectations—and despite the fact that several items indicative of pathology were included—extensive analyses provided little reason to distinguish between pathological and nonpathological forms of celebrity worship. Although this agrees with Rubin *et al.*'s (1985) conclusion that celebrity worship is essentially

[4] We note parenthetically that the sign of the items' loadings (*not* their Rasch location) formed the criterion for dividing the items into the two groups shown in Table 1.

unidimensional, our results are at odds with Stever's (1991) and Wann's (1995) finding of several distinct parasocial interaction factors. Since the aforementioned research administered different varieties of questions, it is difficult to identify the reason for these discrepant findings. We note however that the CWS contains only items without noticeable response biases. Psychometric theory (Stout, 1987) and computer simulations alike indicate that the absence of bias should suppress the emergence of artificial ('phantom') factors (Lange *et al.*, 2000). Stever (1991) and Wann (1995) did not perform bias tests and it is quite possible therefore that their factor analytic results are contaminated. In any case, it is doubtful whether the number of factors as determined via factor analytic criteria agrees with items' dimensionality in the Rasch sense (Hattie, 1985; Smith *et al.*, 1998). Thus, lacking convincing evidence to the contrary, we conclude that celebrity worship is best thought of as a unidimensional construct.

Although the CWS is unidimensional from a psychometric perspective, its items show rather striking *qualitative* differences across the celebrity worship dimension. In particular, the lowest levels of celebrity worship are characterized by solitary behaviours that we interpret to reflect sensation seeking and entertainment, but these behaviours take on a social component at higher levels of celebrity worship. Interestingly, at the highest levels celebrity worship reverts back to the private sphere, but this worship now has obvious obsessive-compulsive features.

Patterns of absorption and addiction?

In order to explain the pattern described above we speculate that an introverted nature and lack of meaningful relationships in celebrity worshippers (Meloy, 1998; Stever, 1995; Szymanski, 1977; Willis, 1972) facilitate psychological absorption in an attempt to establish an identity and a sense of fulfilment. We further propose that the dynamics of the motivational forces driving this absorption resemble those of addiction.

Absorption

Originally educed as the central cognitive feature of hypnosis, absorption is defined formally as 'a total attention, involving a full commitment of available perceptual, motoric, imaginative and ideational resources to a unified representation of the attentional object' (Tellegen & Atkinson, 1974, p. 274). Absorption is achieved through an effortless focusing of attention rather than by determined concentration, and this results in a heightened sense of reality of the idolized celebrity. We expect that this heightened sense of reality promotes worshippers' unfounded beliefs that they have a special relationship or connection with this celebrity, thus motivating them to learn more about their object of attention. Consequently, some worshippers move beyond mere absorption, and they progress to a stage where they seek out other fans as sources of new information concerning the celebrity. Informal social institutions such as fan clubs, Internet newsgroups, and 'conventions' often represent the only socially accepted venues available to acquire additional information and coveted specialized knowedge about celebrities.

If the person's need or capacity for absorption is high enough, worshippers might seek to become more intimately involved with aspects of celebrities' lives to which they lack direct access. Extreme worshippers facing this situation may obtain closeness by acting on the delusional belief that they have a special relationship with the celebrity. From what we understand about the cognitive and emotional dynamics of delusional

thinking (Lange & Houran, 1998, 1999), firmly ingrained beliefs lead people to seek out experiences that reinforce those beliefs; consequently, these beliefs thereby become resistant to extinction (Lange & Houran, 2000). As reality is bound to impinge upon such delusions, continuous efforts aimed at controlling the information provided by the environment are required to maintain a semblance of consistency. This, we suggest, is one reason why empathy turns into obsession at higher levels of celebrity worship.

While the above is admittedly speculative, our hypotheses are supported by the ancillary analyses described in the Appendix. These analyses reveal the existence of qualitative differences between the low and high-worshipping individuals, indicating that greater celebrity worship produces not just higher ratings—but ratings that are significantly more consistent and discriminating. We take this to mean that highly worshipping individuals responded as if they possessed special insights into issues related to their favourite celebrities.

Addiction

Similar to our speculations, Cushman (1990) discussed preoccupation with celebrities as a way to soothe the 'empty self'. Addiction has likewise been conceptualized as a search for a solid identity and social role (Biro, 1999; Voigtel, 2000; Zoja, 1984), and compusive and obsessional elements are noted at advanced stages of addiction (Friedman, Dar, & Shilony, 2000). Thus, while absorption can partially account for the vividness of delusions related to dissociative experience (cf. Robertson & Gow, 1999), the progression along our hierarchy of celebrity worship might reflect increases in the thresholds of the need and capacity for psychological absorption. In other words, worshippers might develop a 'tolerance' to behaviours that initially satisfied their need for absorption. As a result, celebrity worshippers must progressively evidence stronger dissociative behaviours in order to feel adequately connected to the celebrity.

Concluding remarks

In his landmark work, Giles (2000) explains 'celebrity' and the prevalence of celebrity worship in modern societies as direct products of mass media and communications, and this point of view agrees with Showalter's (1997) conclusion that recent technology speeds the proliferation of many types of delusional beliefs. However, sociological factors are not the whole story. We note for instance that in response to the passing of movie star Rudolph Valentino in 1926, desolate fans wrote thousands of memorials to him to help ease their pain and perhaps to tell him in death what he had meant to them in life. For example, this message was sent by a Florida woman:

> His joy became the joy of his beholders. In hundreds of humble households and humble hearts Rudy Valentino represented romance, the bright light down a dark road. And poor work-weary men and women laid down their burdens and laughed and loved with Rudy Valentino. They climbed with him to wondrous heights of illuminated romance and their tired spirits pulsated with new joy. He enthroned them in his fairy palaces and led them to silvery isles. He was their passionate lover, their kingly warrior, their glorious savior, and his beauty, his boast of heraldry, his pomp of power were their own (Readers Digest Association, 1978, p. 388).

Our findings suggest that such feelings may evolve into over-identification, i.e. dissociation, or a loss of self. Dissociation has been linked with episodes of violence (Evans & Claycomb, 1999; Farley, Sikorski, & Benedek, 1975), and this might explain

why some 'fanatical fans' become dangerous in their pursuit of celebrities. Accordingly, rigorous studies of people's needs for heroes, role models, fantasy, escape, and identification, as well as indicators of pathology, must augment sociological perspectives. The development and theoretical import of the CWS is an initial step in this direction, and a research programme is currently underway to test our hypotheses in more detail.

Acknowledgements

We thank D. C. Giles and the other referees for their comments on an earlier version of this paper.

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Received 11 April 2000; revised version received 3 November 2000

Appendix

Based on preliminary findings (Lange, 1999) concerning the Dissociative Experiences Scale (Bernstein & Putnam, 1986), we investigated the category structures of the ratings of the 10 possible pathology items (i.e. 3, 6, 9, 12, 14, 15, 16, 18, 21, and 24). Specifically, the respondents were categorized as either 'low' or 'high' depending on their worship measures, and the 10 items were then scaled separately in each group *without* combining any categories. The results are depicted in Panels A and B of Fig. 4 which show the category probabilities (Y-axis), i.e. the likelihood that a category is selected, given the distance between the person (θ) and the item (Δ) in logits (X-axis).

It can be seen that a five-category structure is acceptable for the possible pathology items in the high group (Panel B), but not in the low group (Panel A). Most damaging, the highest step value ($\delta_4 = -.62$) lies well *below* the second lowest step value $\delta_2 = 0.93$), i.e. the steps are ordered incorrectly for low-scoring respondents. Additionally, the steps are spaced further apart in the high group than in the low group, as the distance between δ_1 and δ_2 in the low group (1.19 logits) is significantly smaller ($z \approx 2.77$, $p < .01$) than the corresponding distance in the high group (1.83 logits).[5] This effect means that high respondents gave ratings that were more consistent and discriminating than those given by low respondents. While the finding of differential category structures has interesting implications (see Summary and discussion above), its impact on the person measures is negligible here. For instance, when in the high group the possible pathology items are coded as 0, 1, 1, 2, 2 and scaled together with the

[5] Analogous to the approach described in note 2, the standard error of difference between the step locations using coding scheme *A* is taken to be $S^A_{\delta_j - \delta_{(j-1)}} = \sqrt{SE^2_{\delta_j} + SE^2_{\delta_{j-1}}}$, where the SE_δ are provided by Facets. A similar expression applies to the different coding scheme *B*. The difference in the 'lengths' of category *j*, i.e. the difference between the distances $\delta_j - \delta_{(j-1)}$ in the two groups, thus has the standard error $S^{A-B}_{\delta_j - \delta_{(j-1)}} = \sqrt{(S^A_{\delta_j - \delta_{(j-1)}})^2 + (S^B_{\delta_j - \delta_{(j-1)}})^2}$. Assuming that the sampling distribution of the δ is approximately normal, the preceding expression can be used to construct an approximate test for differences. Note that the expression under the radical simplifies to the sum of the SE^2 of all four δ involved.

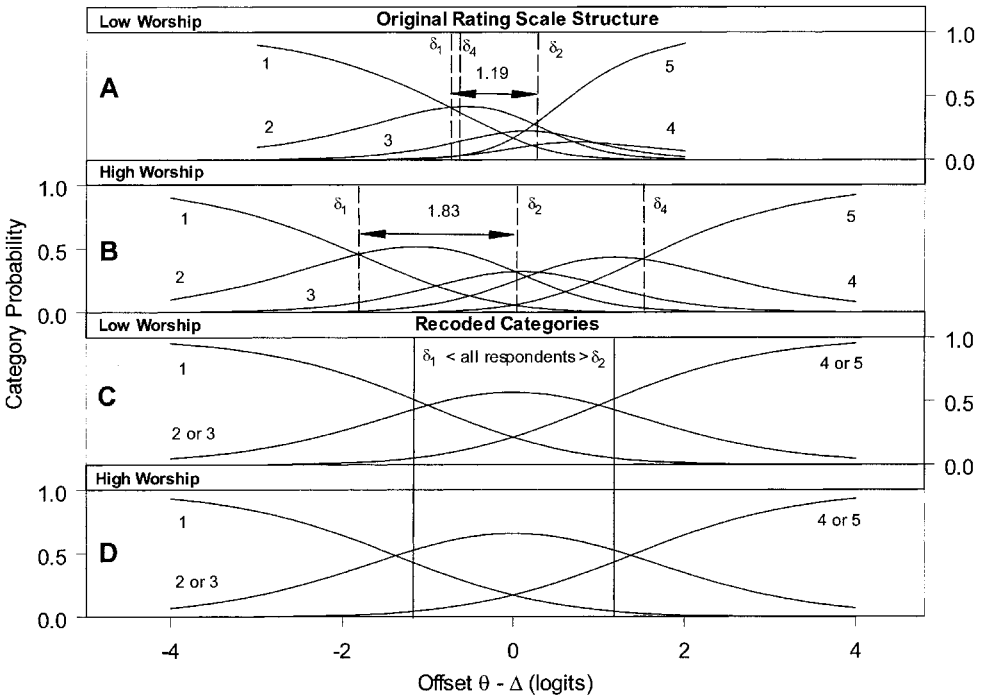

Figure 4. Category probability for Items 3, 6, 9, 12, 14, 15, 16, 18, 21, and 24 for low versus high respondents using two different coding schemes.

fantasy items (namely, 5, 13, 17, 19, 23, 29, and 31), the resulting person measures correlate .97 with those obtained when the five-category scheme is used.

We note that recording the 10 possible pathology items as 0, 1, 1, 2, and 2 corrected several flaws (see Panel A versus Panel C). Specifically, as is indicated by the solid lines across Panels C and D, doing so achieved an admirable compromise between the category structures in the low and high-worshipping groups. However, the logit distance between the step values (i.e. the points at which the probability lines of adjacent categories cross) is still somewhat greater ($z \approx 2.17$, $p < .05$) in the high group (2.76, Panel D) than in the low group (2.00, Panel C).